

ERM, Towards a Holistic View of Risk Management

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Workshop on essentials of effective ERM, Zurich, Switzerland, May 28, 2009

SCOR

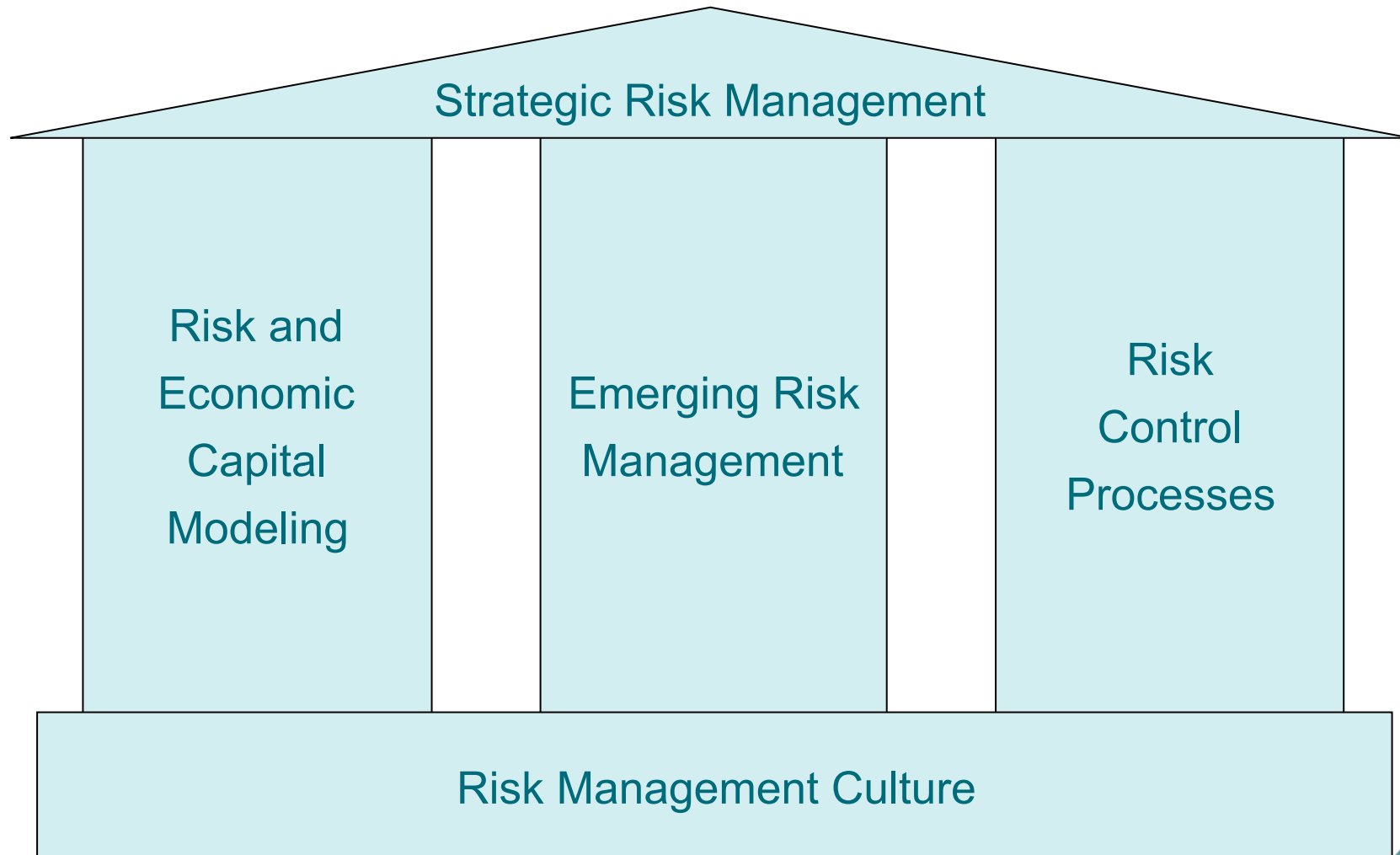
Notice

Certain statements contained in this presentation are forward-looking statements, of necessity provisional, that are based on risks and uncertainties that could cause actual results, performance or events to differ materially from those in such statements.

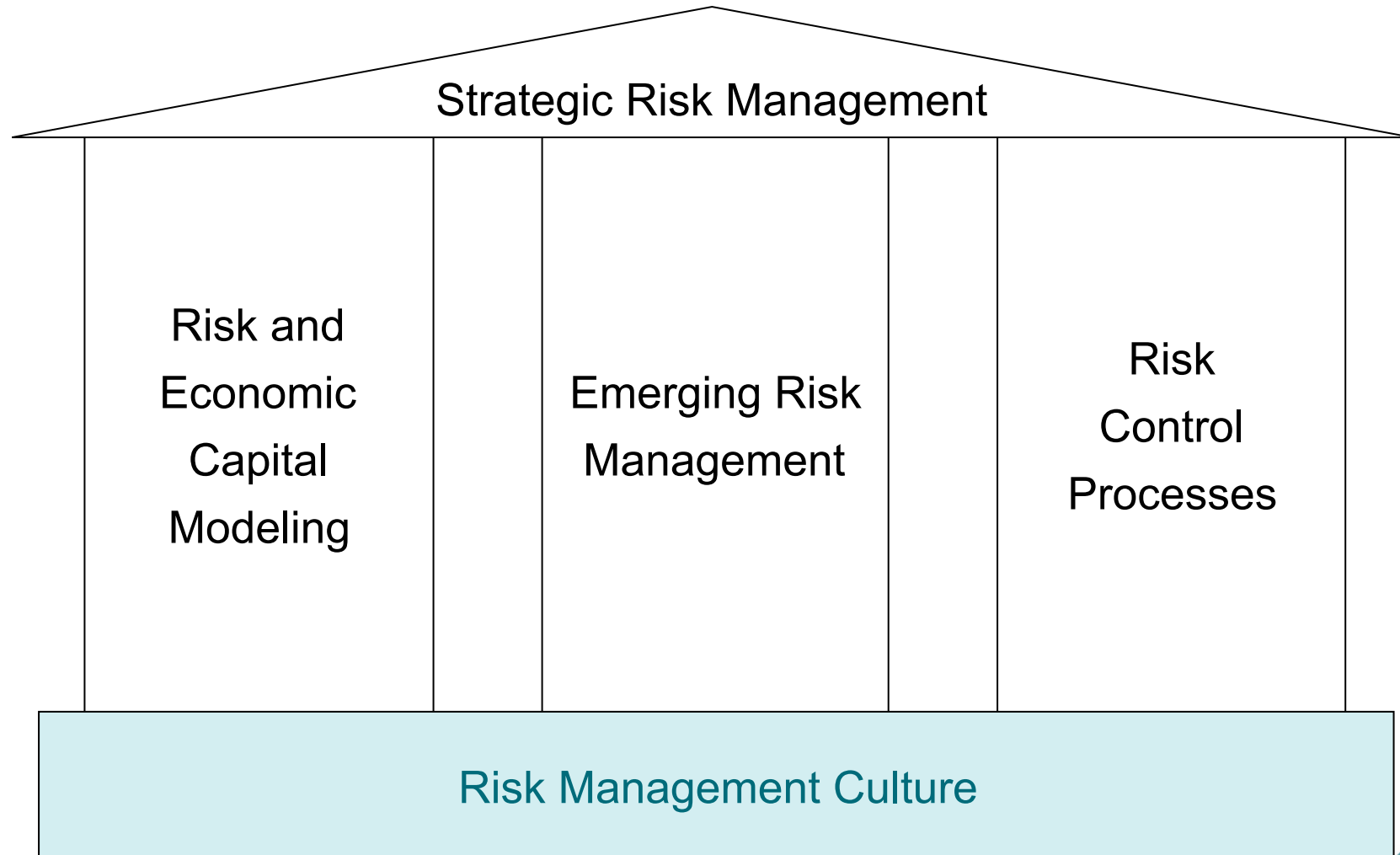
Additional information regarding risks and uncertainties is set forth in the **2008** annual report of the company.

The Group's financial information is prepared on the basis of IFRS and interpretations issued and approved by the European Union.

Building Blocks of ERM



Building Blocks of ERM



Risk Management Culture

- ▶ Establish a risk culture with *strong awareness of policies and guidelines* at all levels of management, and execution for key risks facing the organization:
 - Clearly defined overall *risk tolerance* deduced from stakeholder requirements.
 - Clearly defined *risk preferences* stating which risks to take at all and in what proportion.
 - Clear vision of overall *risk profile*.
 - *Limits* for single risks deduced from overall risk tolerance, risk preferences, and risk profile.

Overall Risk Tolerance Deducted from Strategic Risk Targets

Strategic risk targets

- Minimum Rating of A- (S&P) and A- (A.M. Best)
- Target Rating of A+ (S&P) and A (A.M. Best)
- No risk driver must contribute more than 5% of available capital when looking at the average of 5% worst cases
- No stress test must result in a loss larger than 15% of available capital
- Fulfillment of all regulatory requirements incl. SST and S.II

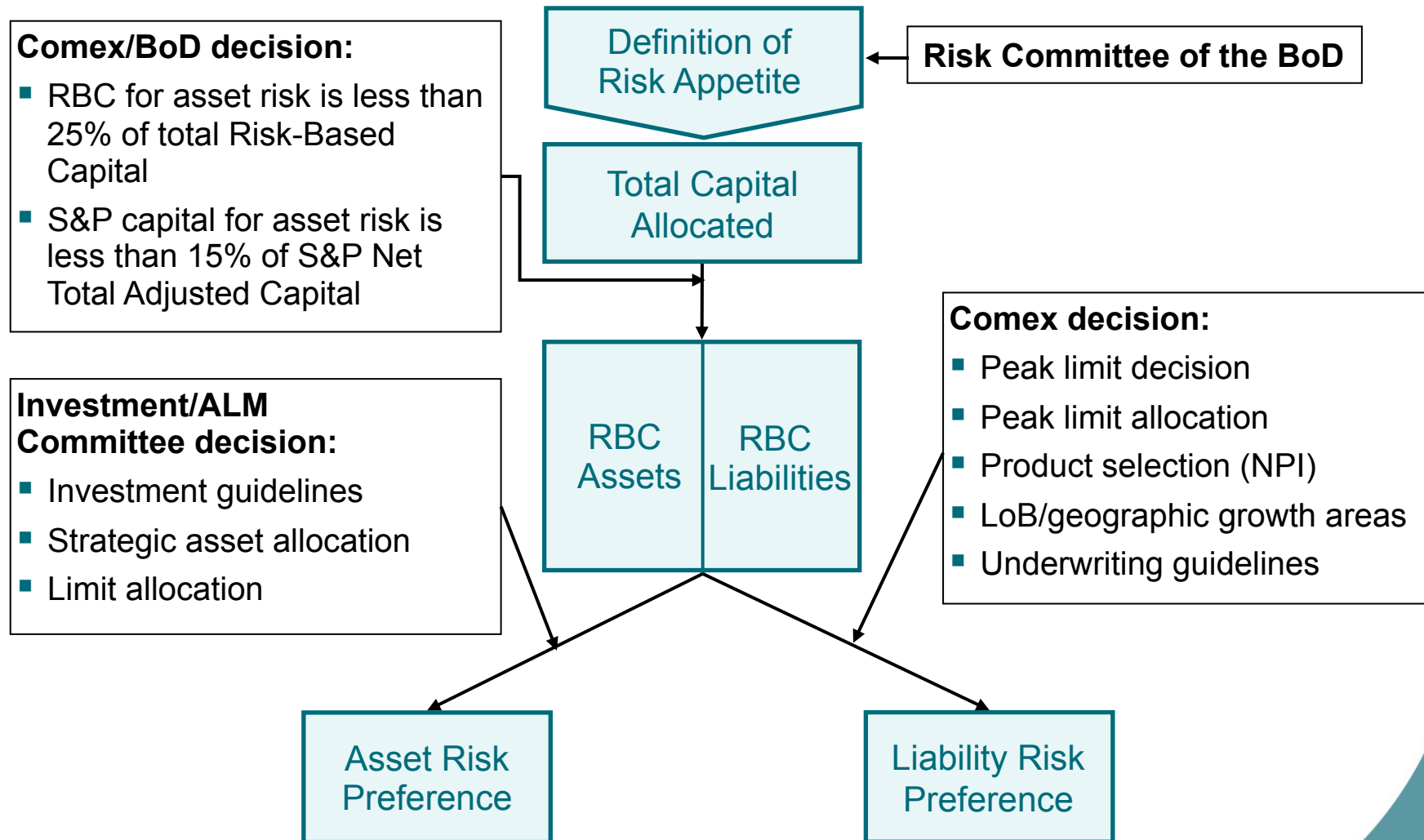
Overall risk tolerance

- Minimum Capital Adequacy Ratio of x% (S&P) and x% (A.M. Best)
- Target Capital Adequacy Ratio of x% (S&P) and x% (A.M. Best)
- Maximum contribution of M € XXX per risk driver for 5% expected loss cases analyzed within the group portfolio
- Maximum loss of M € YYY per company pre-defined stress test for the entire group
- Fulfillment of regulatory capital requirements for each legal entity

Limits, risk appetite, and risk tolerance

- ▶ There is a subtle difference between the limits that we propose to set and our *risk appetite*
- ▶ The limits are related to our *risk tolerance* and are supposed to never be run past
- ▶ Coming back to the 25% limit for asset management, our risk appetite would usually be much lower than this, around 15%
- ▶ If we are already above the 15% let us say at 20%, we should, in normal circumstances, already be taking measure for reducing our risk in order not to get over the 25% limit
- ▶ Similarly with other limits for insurance risks

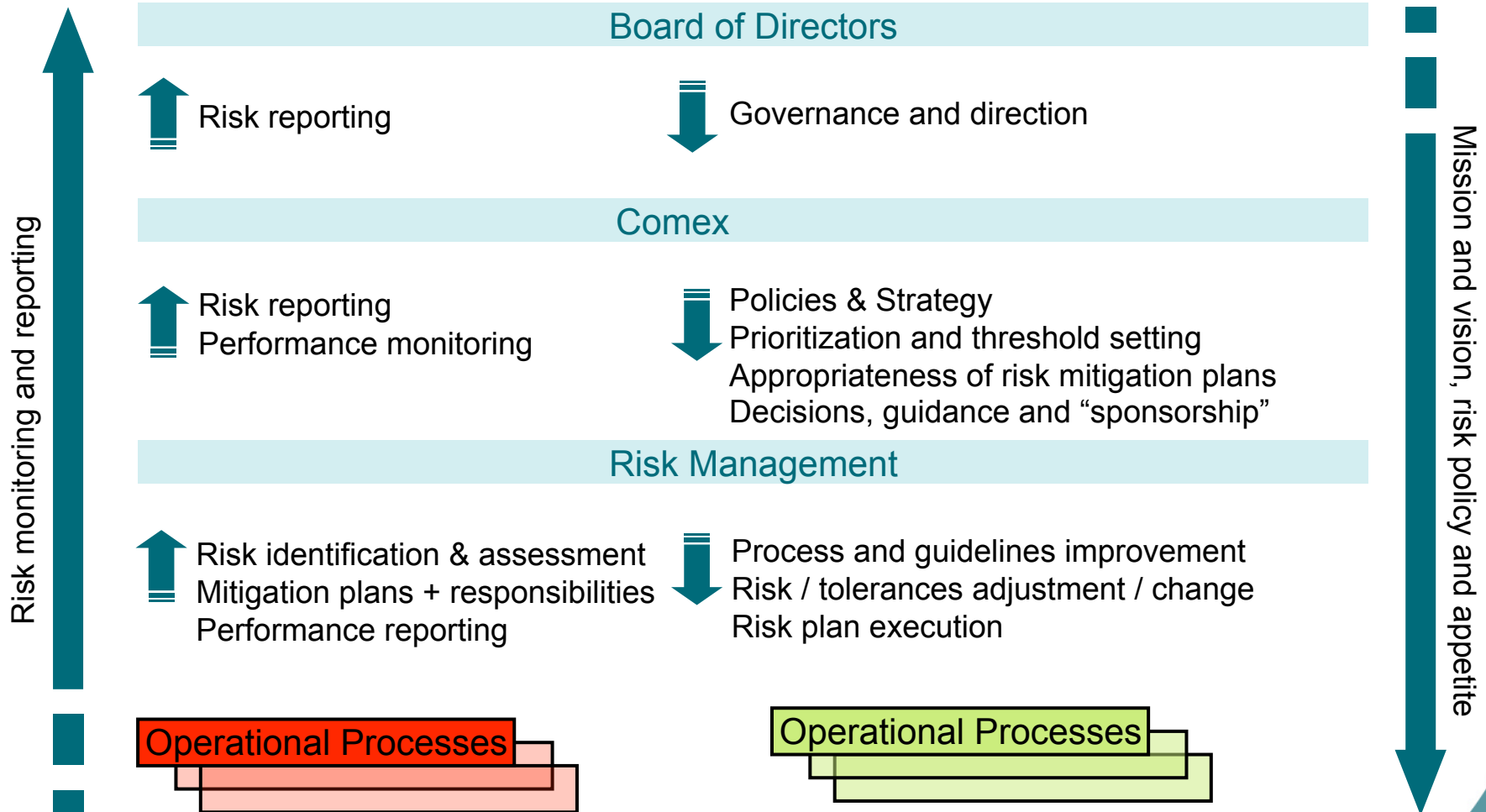
Process to Derive Risk Preference and Risk Profile



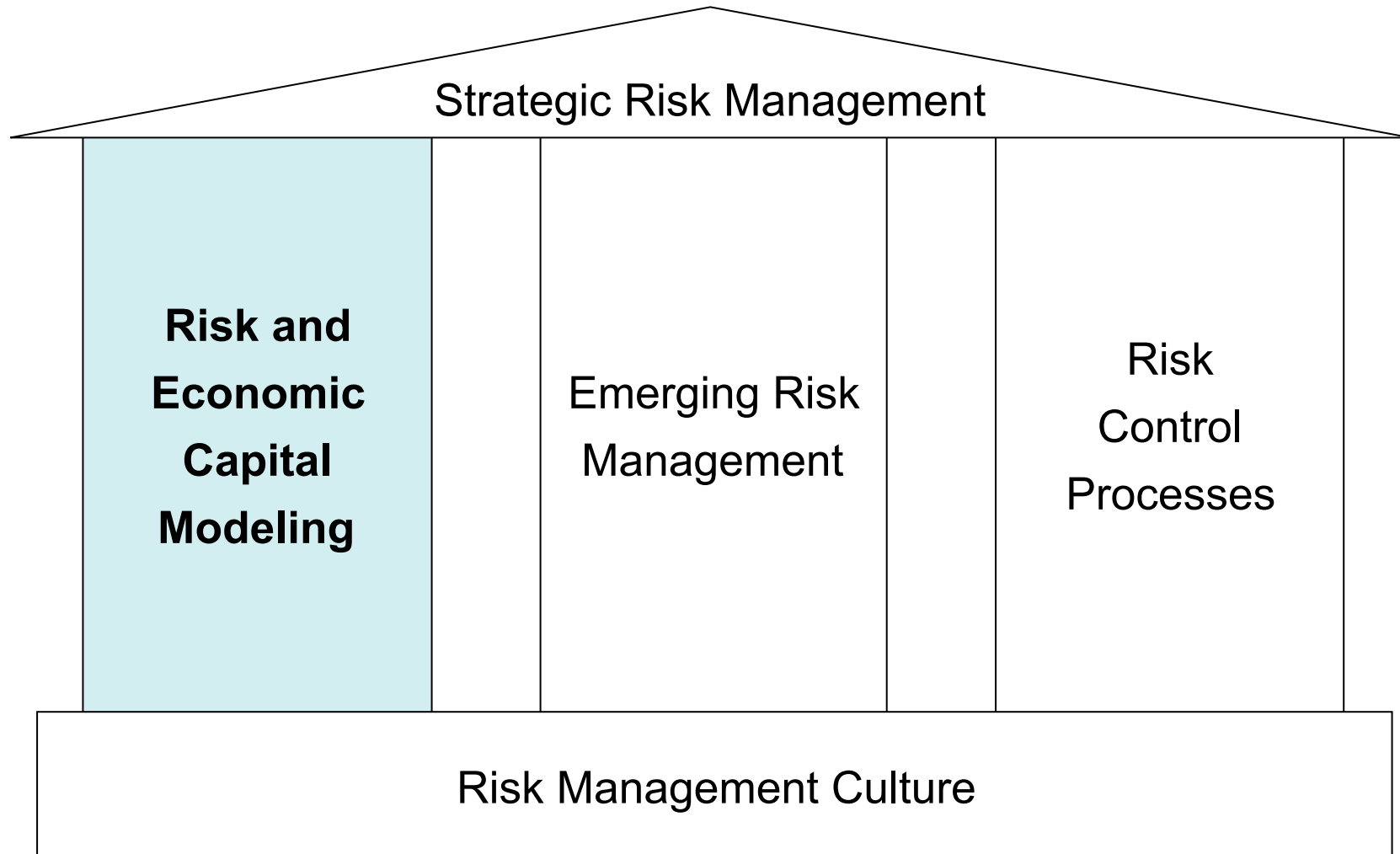
Governance and Communication

- ▶ Highly effective *governance structure* and principles embedded in the organization
- ▶ Consistent risk culture at all levels of the organization.
- ▶ *Regular reporting* to the top management on risks and exposure.
- ▶ Clear *communication of risk-return* considerations to shareholders.
- ▶ *High level of transparency* regarding risk tolerance, risk preferences and risk-return considerations.

ERM Affects the Complete Organization



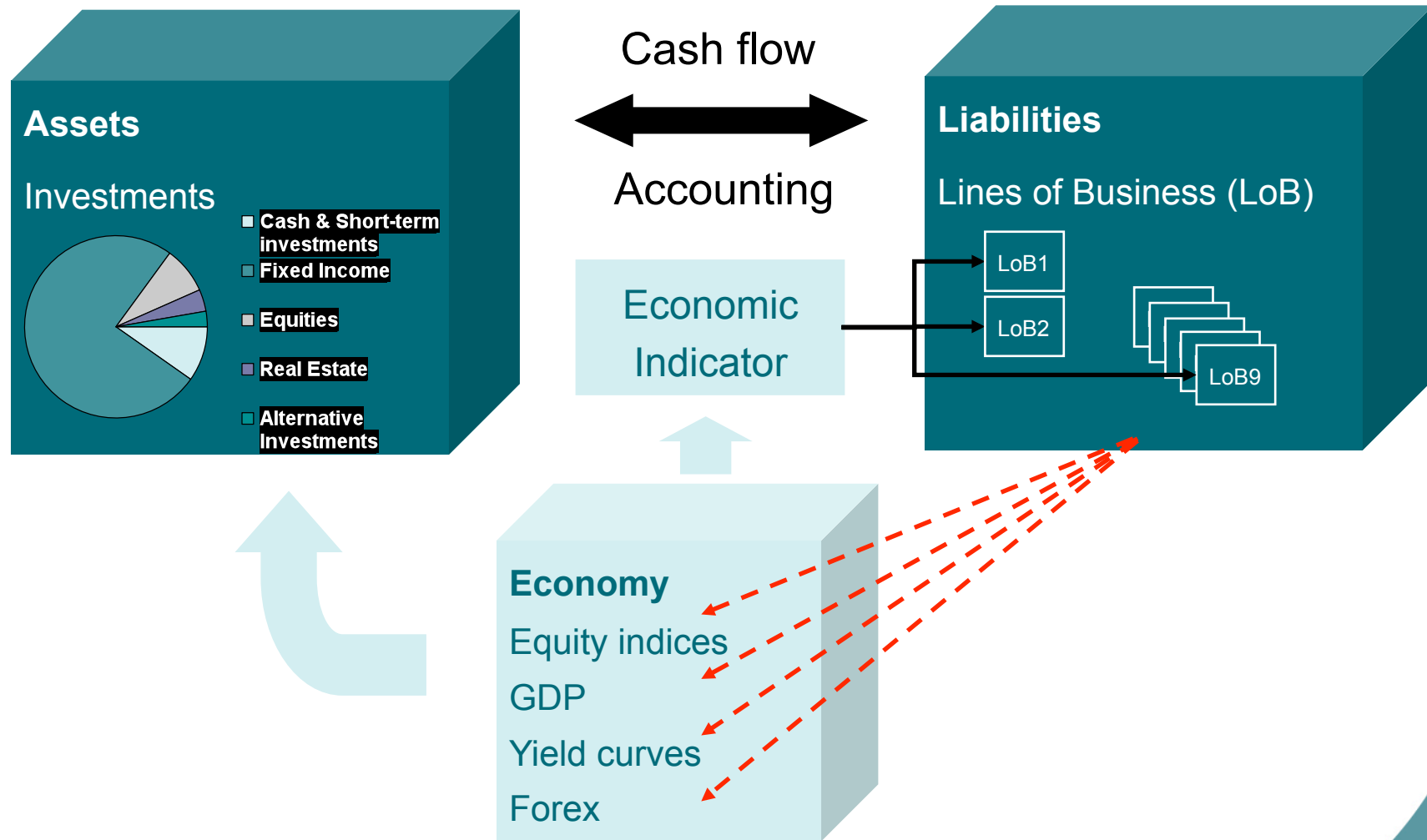
Building Blocks of ERM



Risk and Economic Capital Modeling (1/2)

- ▶ *Consistent model* approach which properly addresses all types of risk: underwriting risk, market and credit risk
- ▶ *Data quality* and appropriateness ensured by regular validation and processes to deal with potential deficiencies
- ▶ *Appropriateness of assumptions* ensured through stress tests, effective processes to derive at assumptions even when some information is missing, and peer reviews
- ▶ *Identification* of main risk drivers
- ▶ Quality assurance of *RBC modeling process* and linkage with ERM and planning processes
- ▶ *Accurate programming* secured for actual status and for all future changes

SCOR Integrates All Models in its ALM Approach (consistent model)



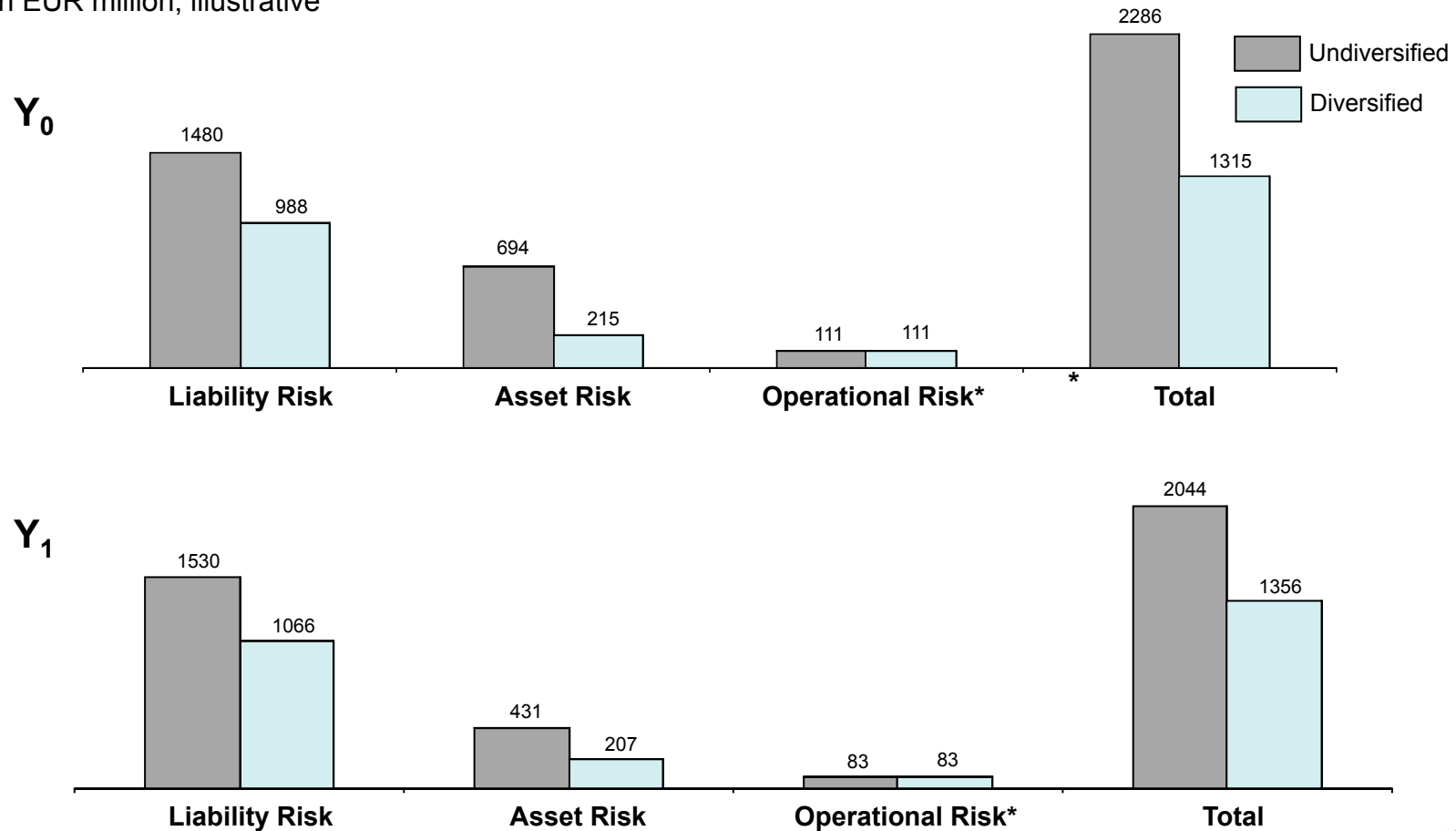
Risk and Economic Capital Modeling (2/2)

- ▶ Careful analysis of the various dependencies between risks.
- ▶ Segregation of duty between modeling and underwriting.
- ▶ Stress test model in order to verify results of stochastic modeling.
- ▶ Incorporation of results into decision-making and business planning process.
- ▶ Deliberate decision to use either:
 - internal models,
 - or external models,
 - or no models for specific purposes

Covering All Risks

Calendar-Year Risk-Based Capital Consumption Y_0 and Y_1

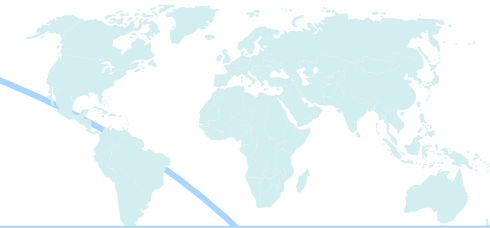
In EUR million, illustrative



* Calculated based on Basel II Standardized Approach

Appropriateness of assumptions: SCOR's model withstands extreme scenarios

Extreme scenarios are an integral part of our ESG



Extreme rates of 0% or below

- The ESG calculates scenarios with interest rates of 0% or slightly below (not below -1%)
- Historic data shows examples of such occasions
- Yen – rates fell slightly below Zero in the early 1990's
- Swiss national bank in the 1980's used negative interest rates as a tool to make investments in Swiss Francs unattractive to fight the strength of the currency



Extreme rates of around 40%

- The national banking institutions have raised the amount of money in circulation on levels not seen for decades
- Expected inflation can only be fought by high interest rates
- Historic examples show that extreme rates can become reality: Mexico, Argentine, Turkey or other EMEA-countries, 26% US Fed rate in the 1980's, hyperinflation of the 1920's in Germany

Stress Testing: Two Forms of Worst Case Analyses Should be Part of the Model

Named events / stress scenarios*

- Analysis of clearly defined and described events
- Events can have happened in the past or may be possible in the future
- Events can consist of a single risk factor or of a combination of several risk factors
- Definition of direct and indirect impact, management actions, and contingency plans

Examples

- ▶ Financial distress
- ▶ Severe adverse development in reserves
- ▶ Tokyo earthquake
- ▶ Retrocessionaires default

* Based on Lloyd's, RDS, scenario catalog by the Swiss Solvency Test (FOPI) and SCOR specific scenarios



Extreme tail scenarios

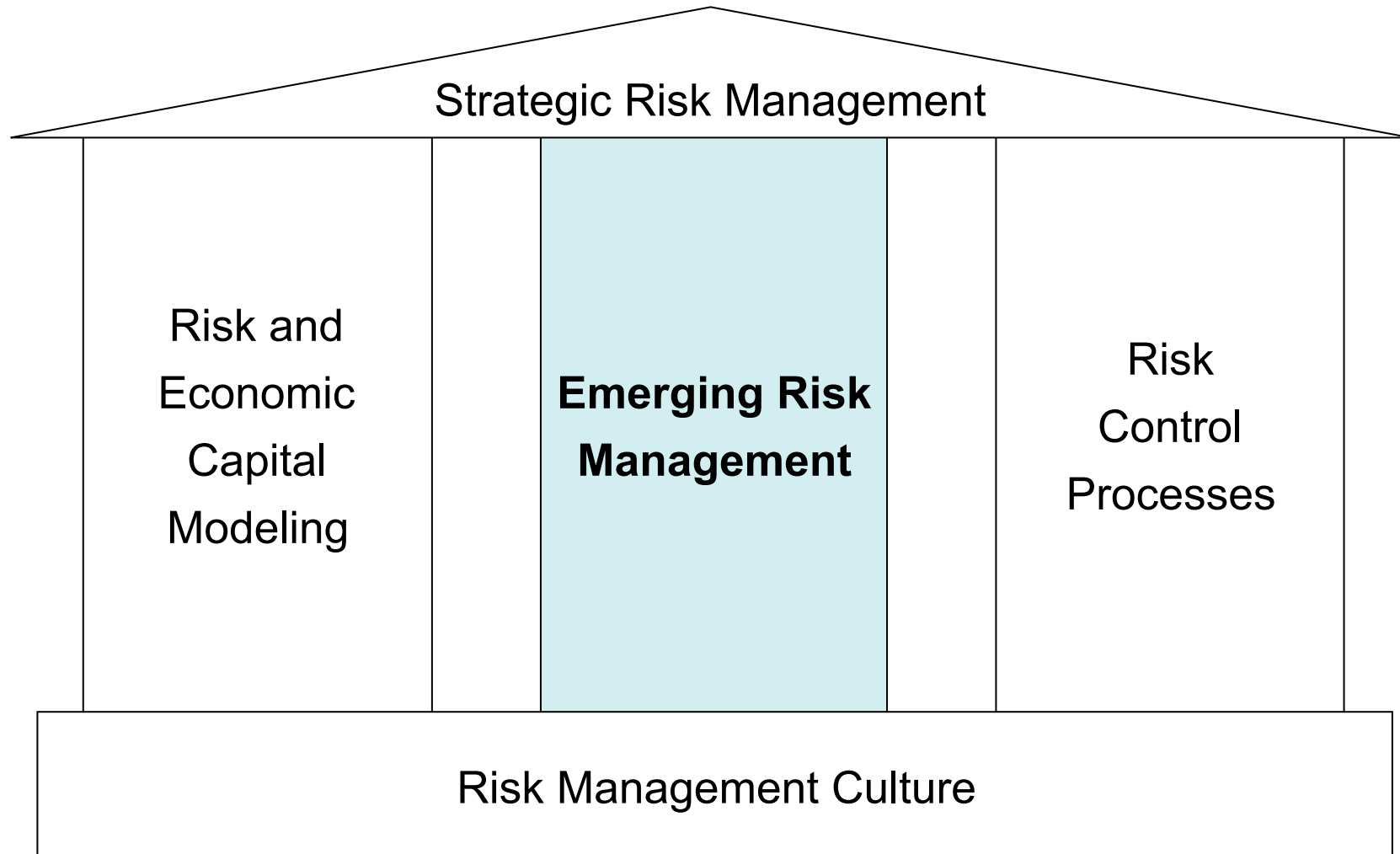
- Detailed analysis of the worst 5% scenarios from the economic scenario generator
- Bootstrapping from past market behaviour and heavy-tailed extrapolation of distributions deliver truly extreme scenarios
- Scenarios consist of a combination of P&L and balance sheet developments

Risk driver examples

- ▶ Aviation
- ▶ Credit & Surety
- ▶ Marine
- ▶ Foreign exchange rates
- ▶ Interest rates

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Building Blocks of ERM



Emerging Risk Management (1/2)

- ▶ Robust process to continuously *identify, assess, mitigate* emerging risks and manage potential incidents.
- ▶ Continuous identification of emerging risks using internal and external sources and central information gathering.
- ▶ Assessment of relevance of emerging risks by identifying affected areas, estimate financial impact and correlation with other risks.
- ▶ Mitigation of emerging risks using:
 - hedging/retro strategies,
 - setting exposure limits,
 - changing terms and conditions,
 - securing access to liquidity (contingent capital, securitization)

Emerging Risk Management (2/2)

- ▶ Developing *watching system* by the Risk Management department to learn from the various governmental agencies and other insurances and reinsurances.
- ▶ Installation of early *warning system* for potential emerging risk incidences.
- ▶ Preparation for *incidence management* by setting up contingency plans and processes to quickly identify losses and settle claims.
- ▶ Set-up of *learning procedures* in order to continuously improve emerging risk management based on experience.

Emerging risk: Possible Top-10 of Emerging Risks

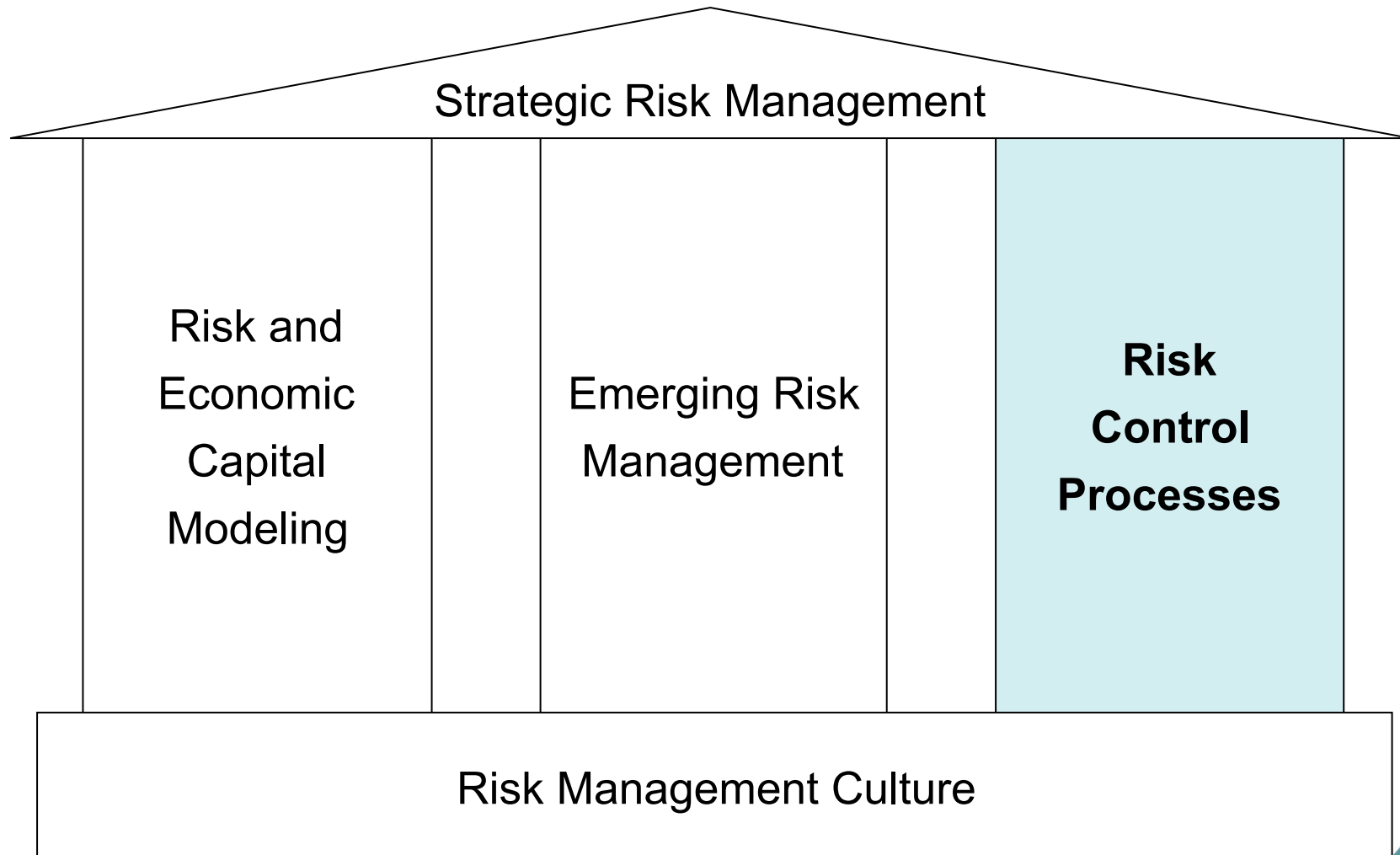
Top-10 emerging risks

- 1) Global Pandemic
- 2) IT / Network Centric Risks
- 3) Climate Change
- 4) Legal / Regulatory Shift
- 5) NBC – Terrorism
- 6) Technology (Nano, GM, chemicals)
- 7) Product Liability
- 8) New Chronic Diseases
- 9) Mega – Projects
- 10) Socio – Economic Breakdown

Options and measures

- Business continuity planning, retro options
- Pre-defined clauses, underwriting guidelines, back-up systems
- Nat Cat model update
- Anticipation and geographic diversification, opt out (exit one market)
- Terrorism exclusion / model, retro cover
- NPI-process, exclusions, underwriting guidelines
- Parameter risk assessment for long-tail business, dependencies calculation
- Pricing, exclusions
- Risk sharing, retro, scenario analysis, limits
- Geographical diversification

Building Blocks of ERM



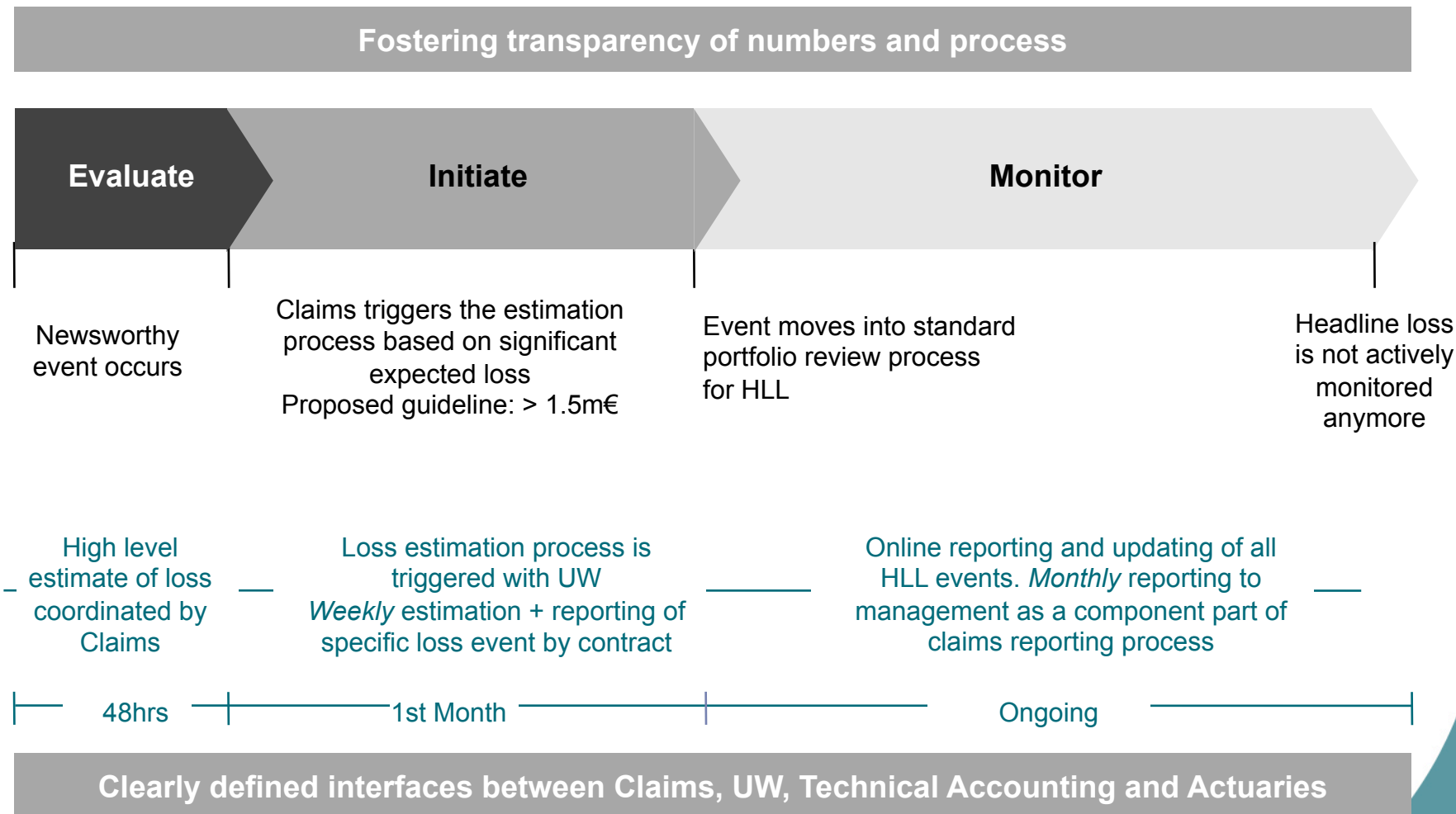
Risk Control Processes (1/3)

- ▶ All risks are continuously *identified, prioritized and control* processes defined and deliberately carried out.
- ▶ *Limits and standards* set for every risk and strictly enforced; consequences for violating limits or standards are clearly communicated and carried out.
- ▶ Every risk is *measured regularly* using appropriate measures by nature of risk.
- ▶ Risk monitoring by *comparing exposures to limits* and suggestion of actions if necessary.
- ▶ Regular *risk reporting* to major decision-makers.

Risk Control Processes (2/3)

- ▶ Timing of measurement, monitoring and reporting optimized taking into account volatility of risk, mitigation period and costs.
- ▶ Clear process to translate measuring, monitoring and reporting into *risk mitigation actions* as well as *risk pricing*.
- ▶ Proper consideration of risk mitigation actions within a period (e.g. management actions).
- ▶ Clear procedures for *loss event management* by following predefined contingency plans.

Loss Event Management: Generic Headline Loss (HLL) Process



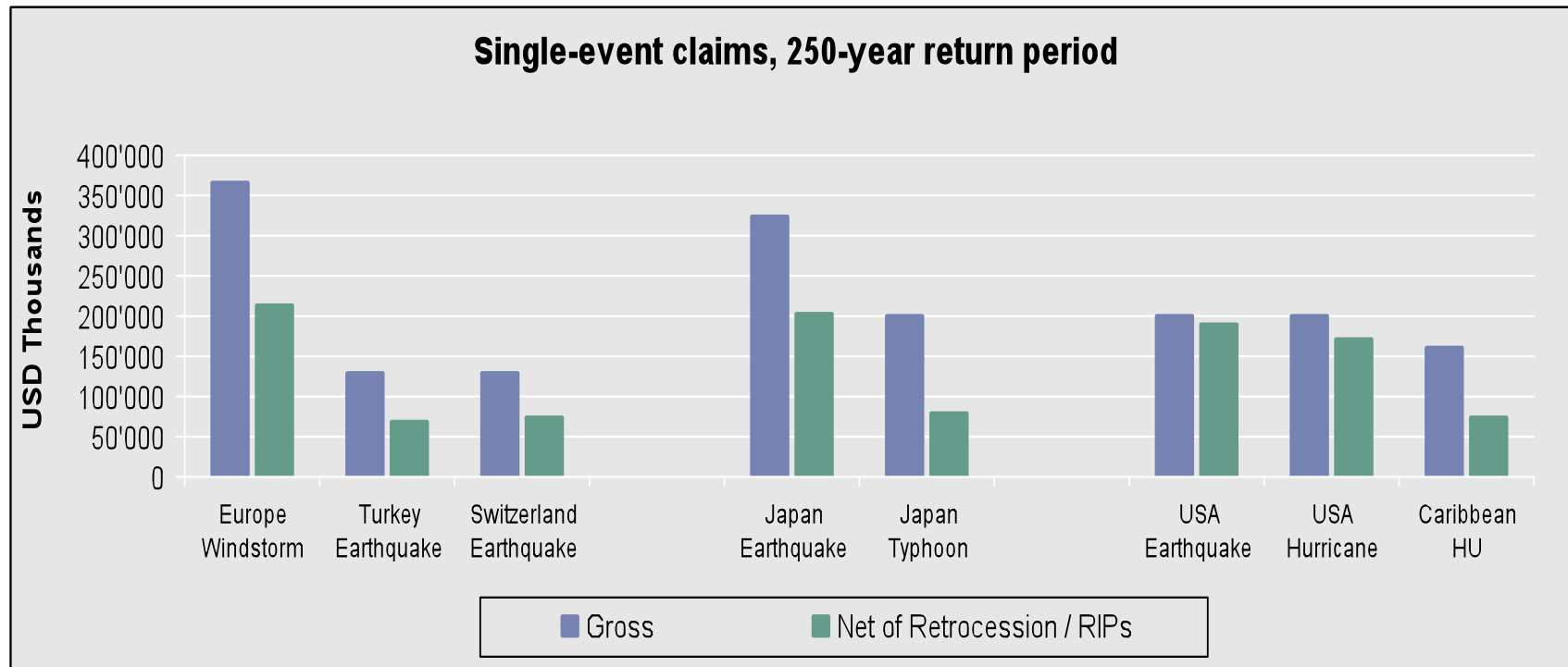
Risk Control Processes (3/3)

- ▶ *Control mechanisms* and processes are properly defined, communicated and executed.
- ▶ Strict *coordination and feedback* loops between profitability analysis, pricing, claims, risk underwriting and reserving.
- ▶ Learning process in place using experiences to make *adjustments to standards*, limits, enforcement, risk mitigation, pricing and event management.

Limit Setting and Enforcement

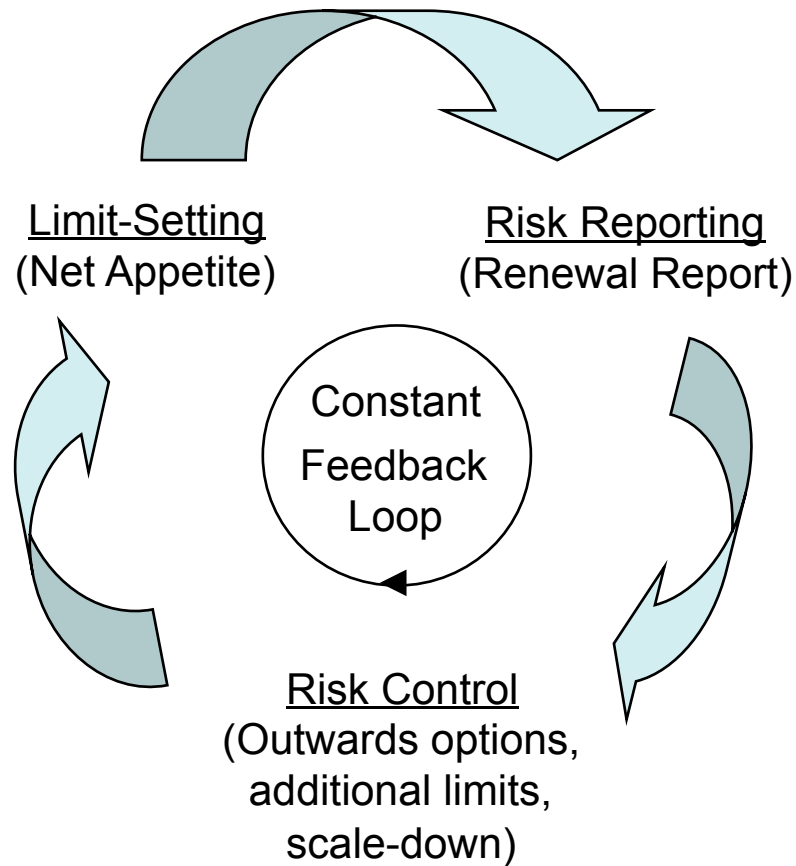
Gross to Net Impact - Plan for next year

Gross and Net distributions (including RI premiums):

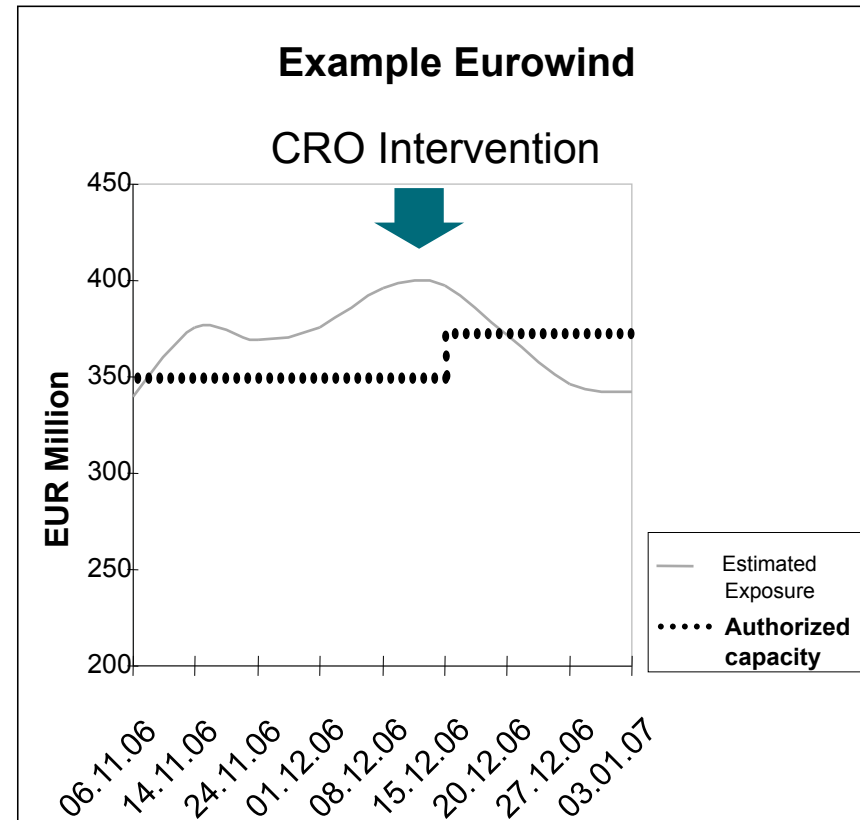


Risk Monitoring / Limit Control

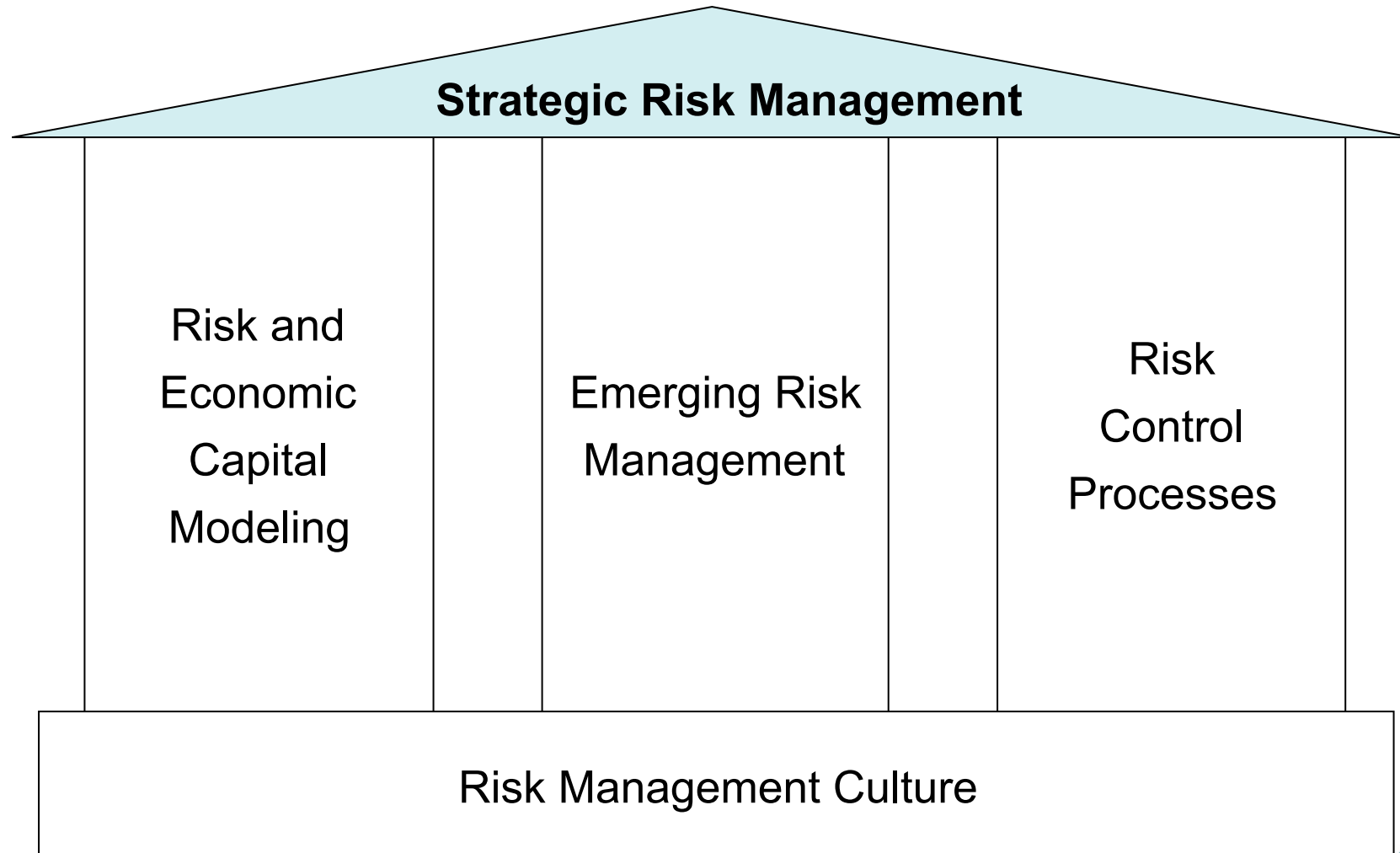
Renewal Process: Risk View



Renewal Process: Monitoring



Building Blocks of ERM



Framework to Strategic Risk Management

Risk appetite, risk preference, risk profile, risk limits

**Strategic liability
risk-return-management**

Allocation between

- ▶ Lines of Business (LoB)
- ▶ Perils
- ▶ Markets
- ▶ Regions
- ▶ Contract types
- ▶ Clients

Retro strategy

**Strategic asset and ALM
risk-return-management**

- ▶ Strategic asset allocation
- ▶ Hedging strategies
- ▶ Duration (mis-)matching
- ▶ Currency (mis-)matching

Strategic Risk Management

- ▶ Strategic decision-making is oriented towards risk-return optimization (e.g. target portfolio).
- ▶ Requirements of regulators, rating agencies, shareholders and internal capital view are incorporated as boundary conditions.
- ▶ Decisions are based on risk-reward orientation (e.g. pricing, terms and conditions, product design, retro program, limits).
- ▶ Risk-return relation is the major basis for capital and resource allocation.

Portfolio Management and Capital Limits

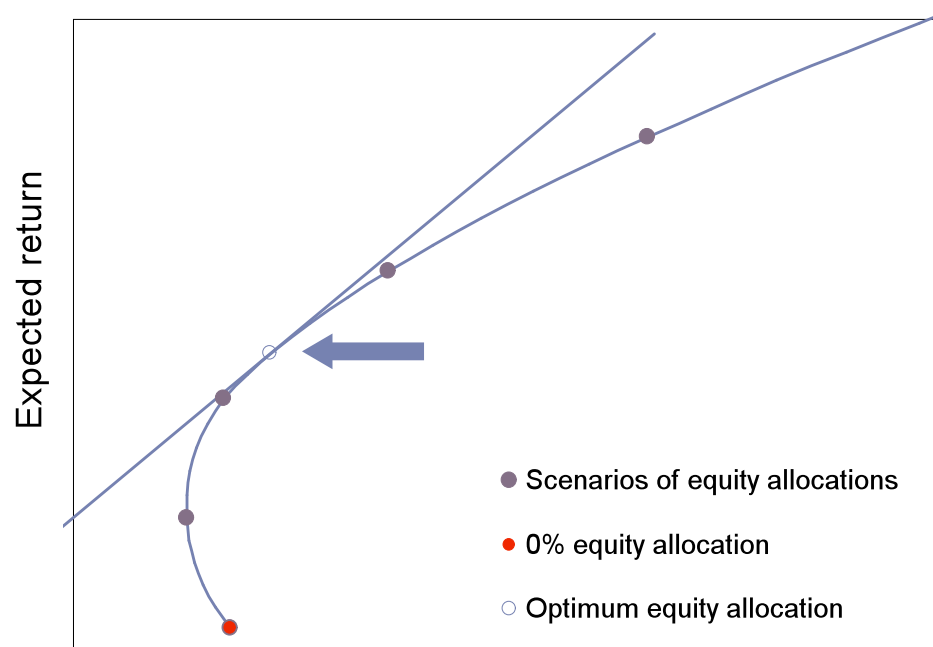
- ▶ Allocating capital to the respective underlying risks is the best way to steer the portfolio towards higher profitability
- ▶ Allocating an amount of the company's capital to a business unit allows to measure its performance
- ▶ It is then possible to reduce or increase the exposure according to the potential results of that particular line of business
- ▶ Thus leading to portfolio optimization
- ▶ This, in turns, facilitates the development of a risk management culture within the company
- ▶ A very efficient way to insure the risk-reward strategy of the company is to set limits to the capital consumptions by the various business units

Risk Adjusted Financial Management

- ▶ There is a clear link between the risk-return relation and the compensation of all decision-makers in the company.
- ▶ Extensive use of risk-adjusted financial management system.
- ▶ Analysis of strategic options based on risk-return positions.

Strategic Asset Allocation (SAA) Based on Efficient Frontier

Risk versus return (efficient frontier)

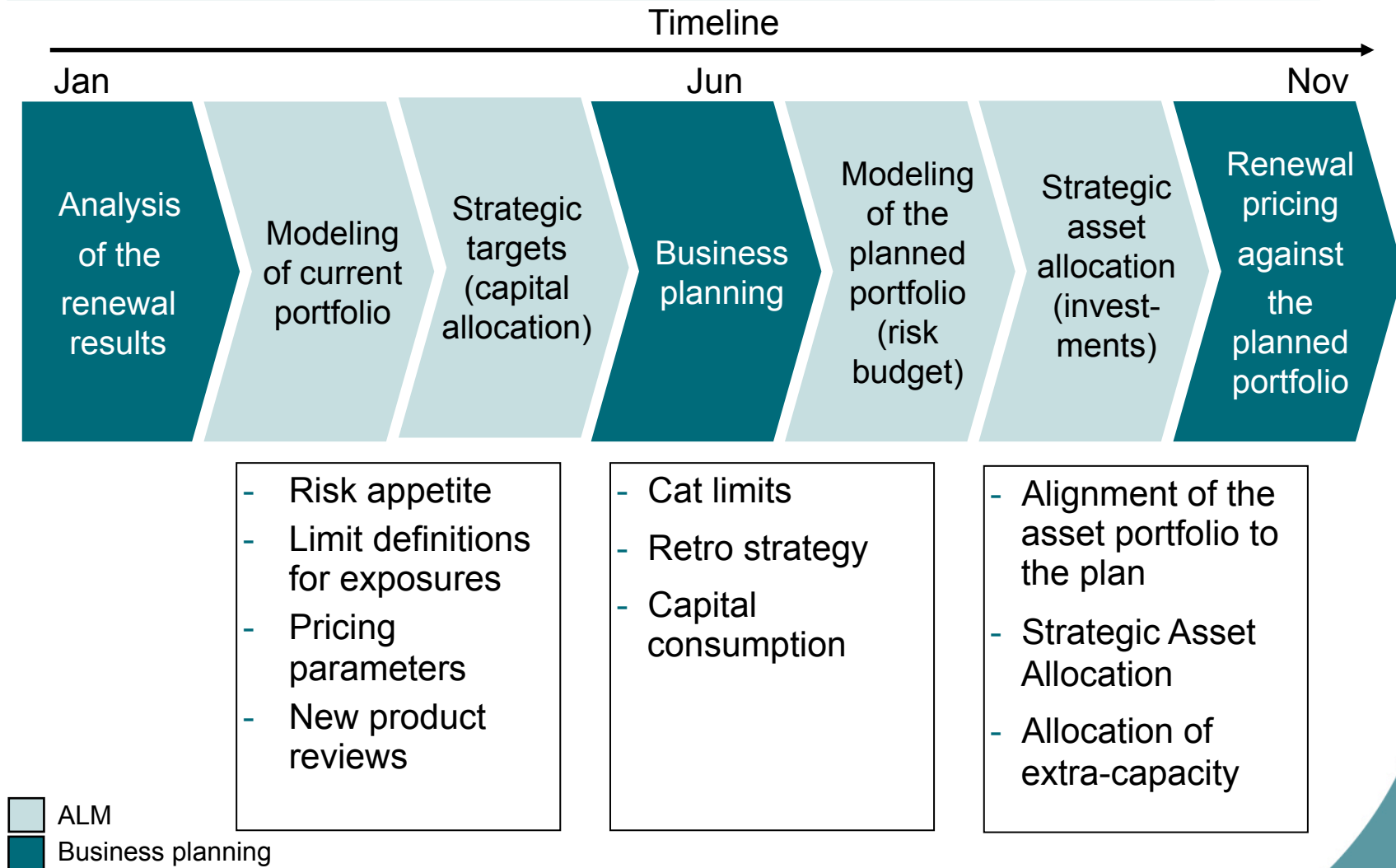


Downside risk (based on expected shortfall)

The investment strategy is based on:

- *Risk/return considerations* for the entire shareholder's equity (including liability risk)
- And *risk aversion* as defined by top management

Strategic Risk Management Means Basing Business Decisions on Risk / Return Analysis



Conclusion

- ▶ ERM is nothing else than sound insurance practice:
 - It encompasses the *whole organization* and its *processes*
 - It helps define the *value drivers* of insurance
 - It allows to *measure the performance* of the business
 - It makes the company *more transparent* to all stakeholders

- ▶ ERM will not simply be a passing trend but a way to become more professional in our business

- ▶ ERM is an essential part for driving the profitability of the business

- ▶ ERM requires the long-term commitment to excellence by the whole organization:

“ We are what we repeatedly do. Excellence, therefore, is not an act but a habit ” (Aristotle)